Habitat Study Group Notes*: May 14, 2009*

Attending: Fred Feyrer (USBR), Steven Detwiler (USFWS), Ted Sommer (CDWR), Farhat Bajjaliya (CDFG), Ryan Olah (USFWS), Cay Goude (USFWS), Wim Kimmerer <phone> (SFSU)

Agenda:

1) Funding issue for Peer Review
2) Idea from IEP/POD for common work plan with Fall Action as subset
3) Adaptive management process
4) Review of conceptual model draft #2; continue progress
5) Action Items/Next Steps

1) The peer review scope is needed by the Science Program soon, funding source still not tied down. The Service will follow up on this item immediately.

2) The common workplan for POD with the HSG Fall Action as a subset was discussed briefly, with special emphasis on integration. The group felt this issue was not a big problem as it fits the existing framework. The table of studies would mark the ones applying to the BO. The IEP Directors will be kept informed before the June workshop to know what will be presented.

3) The adaptive management <u>of the study itself</u> seemed feasible, and Cay agreed this was consistent with the intent of the BO.

4) We discussed the new model drafted following the retreat session.

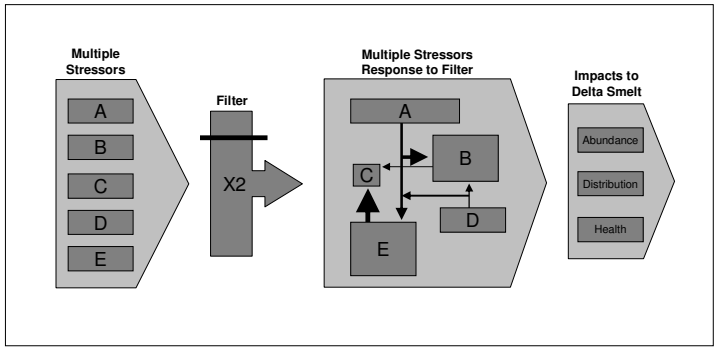
We revisited the "either/or" 15km binomial approach suggested at the retreat versus the linear continuous model per the original vision. It was pointed out that even with a threshold across which you moved X2, the result will look like a line and not a step. The movement of X2 itself will average it out, you can not tell a point itself with the tides and intraseasonal X2 movement. Measurement error and uncertainty linearize the result, so it would be surprising to find a threshold.

Fall X2 effect pushes the system a certain way from pelagic production to a littoral, alien-dominated system. The model needs to capture this somehow.

The new model is instantaneous (a snapshot). The wine bottle model reflected more of the alternative states approach. The knob turns need to be big, but we just need the alternative ecosystem model in there.

The new model is a good overview mechanistic model, but the alternative system state idea must be explicit in the higher level models.

The group decided to use the new model, but to split it into two states: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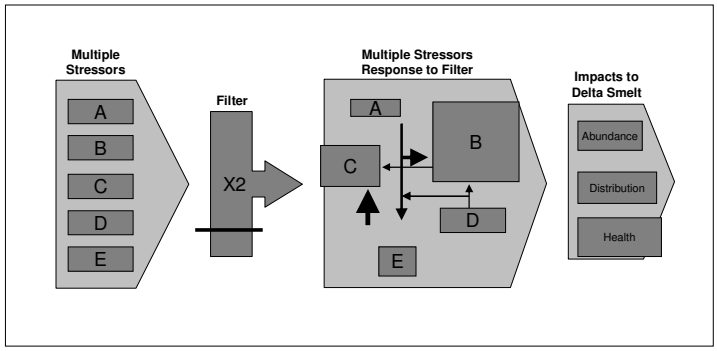
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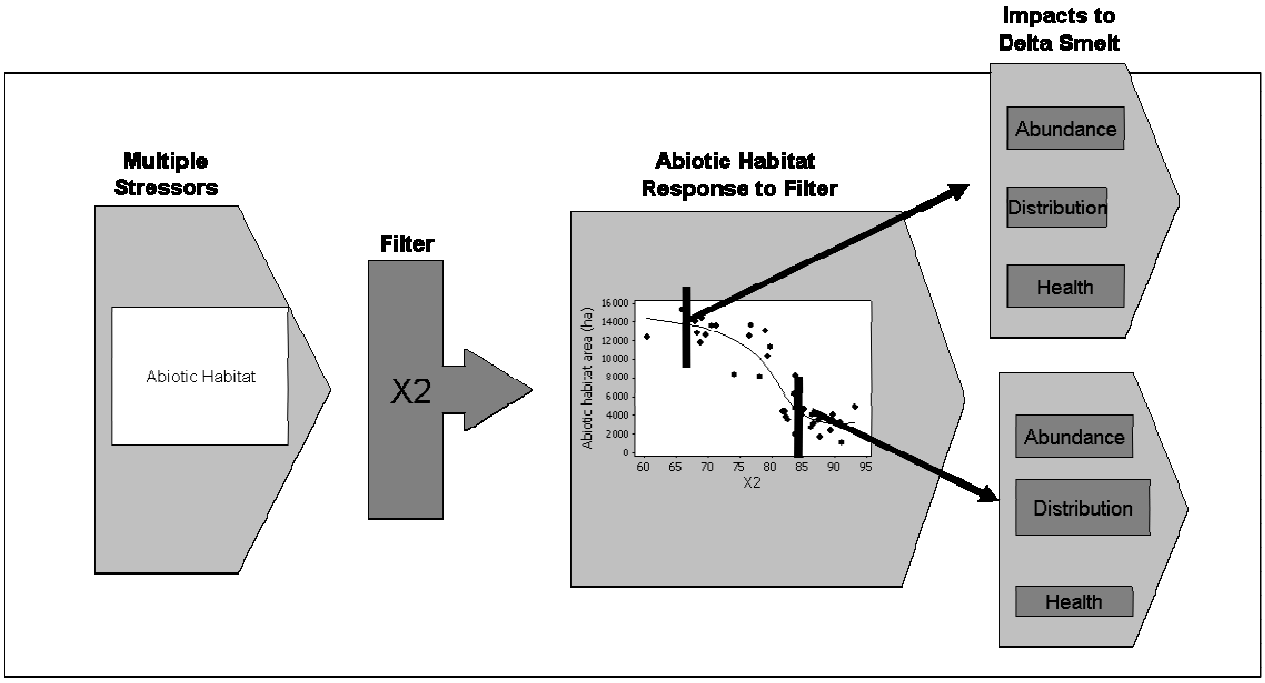
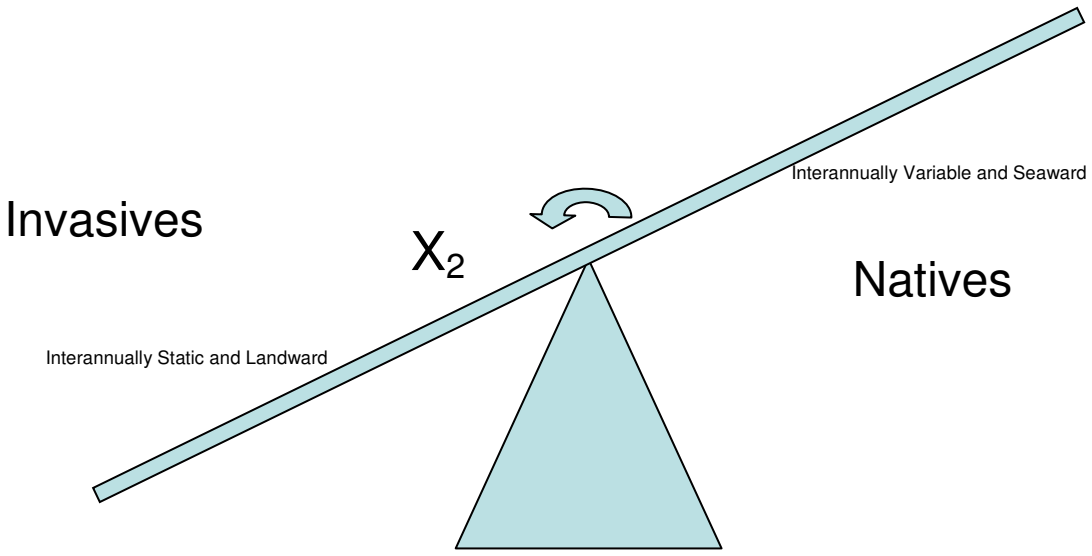


But how do we capture the alternative estuary idea?

Suggestion that we use something like the tippy scale…



X2 is one of the things that tipped the balance to invasives…

The "tippy scale" metaphor isn't quite apt though - implying that the system exists in two potential states with a sharp break between them. Although we have seen changes, some

of them large, is there any evidence that the system has changed states in any sharply defined way?

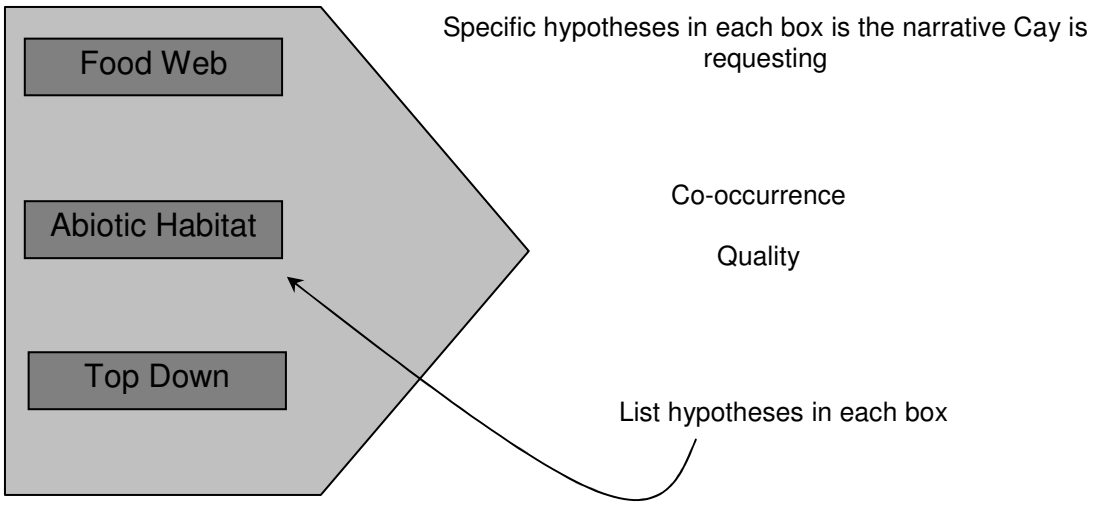
What about 1987 or 2000? There seem to have been pretty substantial shifts in species abundance (e.g. X2 relationships) during both periods. This is consistent with the "state change" work done by your NCEAS group? This does not mean that there still is not a gradual or somewhat rapid change within different phases.

The tippy scale idea is consistent with the ecological literature (e.g. hysteresis), particularly for shallow bodies of water (e.g. Sheffer studies). Alternatively, Sheffer (2004) has pitched the idea of marbles in a basin with a couple depressions. The marble tends to stay in whatever low spot that it is in unless "pushed" to the other part…where it has a hard time leaving. However, the marble can "rock" within each divet & there are no sharp corners.

The marble metaphor is really more apt. However, even that doesn't work that well if you think about the nature of the 1987 change which was an alteration of the system by the addition of a new species with new (to this system) capabilities, which had to cause some adjustment. So it was a move to a different stable-ish state, but one that had not even existed before. As for the 2000-2004 change, it would be hard to argue that change came about because of positive feedback, esp. since we really don't have a handle on the cause.

The group decided to run the model in terms of Delta Smelt input in fall, interactions in the central box, and finally the Delta Smelt output (as in the diagram above).

The group resolved to focus on homework assignments to set a good table for next week's in-person, all day meeting.



5) Action Items:

Fred will work on advancing a template for the model tomorrow, send to Wim and Ted.
Wim will work on the food web component of the narrative/model, getting something to group by COB Tuesday May 19.
Fred will work on Abiotic Habitat part, due COB Tuesday May 19.
Ted will work on the Top Down box, due COB Tuesday May 19.
Steve will segregate hypotheses so far by the boxes and send to Fred, Wim, and Ted by COB Friday
Steve and Cay will progress on independent peer review funding issue

Leftover Action Items:

Steve will draft scope for independent peer review, including charge and expertise
Steve will discuss public input process with Service management and solicitor